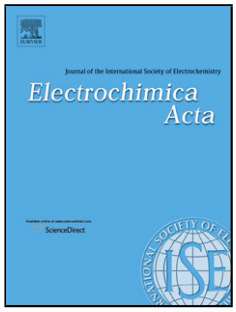

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Low-temperature Fabrication of Highly-Efficient, Optically-Transparent (FTO-free) Graphene Cathode for Co-Mediated Dye-Sensitized Solar Cells with Acetonitrile-free Electrolyte Solution

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Highlights

- Graphene-modified stainless steel (in the form of woven fabric) is applicable as a cathode in Co-mediated dye-sensitized solar cells with acetonitrile-free electrolyte solution.
- Graphene oxide, either pure or in composites with graphene nanoplatelets or with stacked graphene fibers are efficient electrocatalysts for these cathodes.
- The composite electrodes prepared at temperatures ≤200°C show comparable or even better performance than the thermally platinized FTO.

ABSTRACT

Propionitrile electrolyte solutions mixed with sulfolane or with 1-ethyl 3-methyl imidazolium tetracyanoborate (ionic liquid) are optimized for $Co(bpy)^{3+}/Co(bpy)^{2+}$-mediated DSCs working at low illumination intensity. Highly-active cathode catalysts based on graphene oxide, either